In order to determine the constants, two sets of experiments were carried out. In the first set the cups were made rapidly to rotate by opening the movable lid of the box and passing an air current through the wind channel; then the lid was suddenly closed, thus making v zero, and the motion of the cups was recorded from that instant until the cups came to rest. The general equation reduces to—

$$d\omega/dt = a + b\omega + d\omega^2.$$

The constants a, b, and d were determined from the results of the experiments. In the second set of experiments, the cups being initially at rest and the lid closed, a *constant* current was passed along the channel. The lid was then opened, and the motion of the cups began to be recorded from that instant. The general equation

$$d\omega/dt = (a + cv + fv^2) + (b + ev)\omega + d\omega^2$$

could be written

$$d\omega/dt = a' + b'\omega + d\omega^2,$$

where a', b' are constants depending on the constant velocity, an equation similar to the preceding. In this way all the constants of the general equation could be deduced, and the final result is

$$(t+4.9)d\omega/dt = -1.76 - 0.667\omega + 0.50v - 0.098\omega^2 + 0.140\omega v + 0.84v^2.$$

The interesting case for meteorologists is that of the steady state when $d\omega/dt$ is zero, and the anemometer is rotating uniformly with angular velocity ω in a steady wind velocity of v. The relation between ω and v is then found by equating the right-hand side of the equation to zero. For values of v greater than 3 meters per second the solution reduces approximately to $v = 0.90 + \omega/3.74$, which gives a linear relation between the wind velocity and the rotation of the cups.—*R. Corless.*

REPORT OF THE WORK CARRIED OUT BY THE STEAMSHIP "SCOTIA," 1913.[1]

By G. I. TAYLOR.

[Reprinted from Science Abstracts, Sec A, June 25, 1915, § 653.]

* * * D. J. Matthews [hydrographer to the expedition] obtained full observations dealing with the bathymetry, salinity, temperature, and ocean currents of the area, and noted the position of all the ice observed. The observations indicate the conditions at the boundary of the cold, relatively fresh and slow-moving Labrador current which flows southward and southeastward from Davis Strait into the Atlantic, and the warm, saline and more rapidly-flowing Gulf stream, which flows across the path of the Labrador current from west to east and compels the latter to dive below.

Taylor's report [of the meteorologist] is noteworthy for the fact that on 14 separate occasions he was able to raise a kite carrying self-recording meteorological instruments from the deck of the *Scotia*, and to deduce from the records obtained important results with regard to the rate of propagation of temperature changes from the surface to the upper air, showing that the distribution of temperature in height is due to the action of eddies and resembles the process of heat conductivity in its mode of operation. New results regarding fog at sea are also obtained. In four of the kite ascents there was no fog, and the temperature uniformly fell with height (positive temperature gradient). The other 10 cases were associated with negative temperature gradients, and in 9 of them fog was noted to be present. Fog production appears to depend upon the mixing by eddy conductivity of layers of different temperatures and humidities, rather than upon the cooling below the dew point of a homogeneous mass of air. With regard to the suggested detection of the presence of icebergs from their effect upon the temperature of the sea, the conclusion is reached that in the regions visited by the *Scotia* the results obtained do not bear out the suggestion.—*R. Corless.*

[1] Report to the Board of Trade, London, 1914, 141 p. 4°. Text.

RADIUM CONTENT OF WATER FROM GULF OF MEXICO.[1]

By S. J. LLOYD.

[Reprinted from Science Abstracts, Sec. A, July 26, 1915, § 863.]

The growing recognition of radium as an important factor in geological processes has led to a multiplication of analyses of rocks and soils for that substance. With the object of obtaining further evidence on the question of the distribution of radium in the ocean, which at a minimum estimate contains 1,000 tons of radium, the author has made a careful examination of the water of the Gulf of Mexico. The measurements were made in the usual type of vacuum emanation electroscope and the results, with those of other observers, are included in the following table:

Observer.	Sea.	Radium per liter of water.
		Grams.
Joly	Various oceans	17.0×10^{-12}
Eve (1907)	North Atlantic	0.3×10^{-12}
Do	do	0.9×10^{-12}
Satterly	English sea waters	1.0×10^{-12}
Lloyd	Gulf of Mexico	1.7×10^{-12}

Excluding Joly's abnormally high results, an average value for the radium content of 1 liter of sea water is 1.2×10^{-12} gm., representing a total amount of 1,400 tons in the sea. According to the author, 100 liters of sea water should contain from 0.3 to 0.5 milligram of uranium.—*A. B. Wood.*

[1] Amer. jour. sci., May, 1915, (4) 39:580-582.

DISCUSSION ON ANTARCTIC METEOROLOGY.[2]

This discussion was opened by G. C. Simpson, briefly summarizing the general circulation of the atmosphere in the Southern Hemisphere as given in the textbooks, in Lockyer's "Southern Hemisphere surface air circulation," and Meinardus's "Discussion of the results of the *Gauss* Antarctic expedition."

1. Dr. Lockyer suggests an intense anticyclone over Antarctica, from which cold air feeds into a series of large cyclones circulating the southern ocean and having their centers near latitude 60°S. The cyclones are supposed to be so large that while their southern extremities sweep over the edge of Antarctica their northern extremities reach to latitude 40°S., and so dominate the weather of Tasmania and New Zealand and to some extent that of South Australia.

[2] *Reprinted from* Report of the Eighty-fourth Meeting of the British Association for the Advancement of Science, Australia, 1914. London, 1915. p. 302.